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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/362,521	07/28/1999	YUNZHOU LI	10360/027001	6953

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EXAMINER

PRIETO, BEATRIZ

ART UNIT	PAPER NUMBER
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2142

DATE MAILED: 01/28/2004

20

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/362,521

Applicant(s)

LI, YUNZHOU

Examiner

B. Prieto

Art Unit

2142

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-13, 15-20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-13, 15-20 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

***DETAILED ACTION***

1. This communication is in response to amendment filed 11/17/03, claims 1-7, 9-13, 15-20 and 22 remain pending and have been examined as hereby set forth.

2. In regards to the claim as amended, it is noted that whenever there is an amendment to the claims pursuant to paragraph (d) of this section, there must also be supplied, on pages separate from the pages containing the changes, the status (i.e., pending or canceled), as of the date of the amendment, of all patent claims and of all added claims, and *an explanation of the support in the disclosure of the patent for the changes to the claims made by the amendment paper* (see Status of claims and support for claim changes MPEP 2234).

3. Further in regards to the claim as amended, it is noted that the boundaries of the patent protection sought are set forth definitely, albeit negatively, the claim complies with the requirements of 35 U.S.C. 112, second paragraph. An attempt to claim the invention by excluding what the inventors did not invent rather than distinctly and particularly pointing out what they did invent. In re Schechter, 205 F.2d 185, 98 USPQ 144 (CCPA 1953). A claim that recites a limitation in order to exclude the characteristics of the prior art, is considered definite when each recited limitation was definite.

Specifically, in this case it is noted that *any exclusionary proviso must have basis in the original disclosure*. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See In re Johnson, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) (“[the] specification, having described the whole, necessarily described the part remaining.”). See also Ex parte Grasselli, 231 USPQ 393 (Bd. App. 1983), *aff’d mem.*, 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement (see MPEP 2173.05(i)).

According to applicant’s disclosure, if PIM routers use MOSPF which adds an multi-cast capable bit set to the link state advertisements of OSPF to generate link state advertisements, the router will receive not only the arrangement and costs of connections in the network, but also information describing which routers support multicasting; using the information received from the link state advertisements, router can generate a multicast routing table in addition to a unicast routing table (see page 8, lines 1-27 and page 9, lines 1-9).

*Claim Rejection under 35 U.S.C. 103*

4. Quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action may be found in previous office action.

5. Claims 1-4, 6-7, 9, 13, 15-20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deering, S.: Multicast routing internetworks and extended LANS in view of Shah, et. al. (Shah): Performance under a failure of Wide-Area datagrams network with unicast and multicast traffic routing.

Regarding claim 1, Deering teaches substantial features of the invention as claimed, teaching

receiving link state advertisements by a router link state information from all routers attached to that link in the network (single destination), thereby learning all the link state and all the routers attached to that link from which they can determine the complete topology of the internetwork, the each router computing the shortest path tree spanning tree (section 6, page 98-99, section 4, page 91-92);

extending the link-state routing to support shortest-path multicast routing by receiving link state advertisements from routers in a network and constructing a multicast routing table from the received link state packets, the table corresponding a short path tree through multicast routers (section 6, page 98-99);

wherein the ("multicast routing") table includes ("routing") entries of ("link state advertisement") state information having and capable of holding a "multicast capable" bit set (multicast addresses including multicast address of group members associated with the multicast router (page 92);

although prior art teaches learning all the link state and all the routers attached to that link and constructing unicast collection or report using received membership reports from routers on the network, it does not explicitly teach constructing an unicast routing table from received link state advertisements;

Shah teaches constructing a unicast routing table from received link state packets, wherein said tables corresponds to a short path tree from multicast routers (section 3.3); additionally teaching wherein table includes routing entries of link state advertisement information having and capable of holding a "multicast capable" bit set indicating that the associated router is a multicast router, specifically, wherein MOSPF multicast capable routers maintain current image of the network using OSPF link-state protocol, supported by using multicast addresses (e.g. Ipv4 class D, i.e. a bit set to specify multicast host groups) to uniquely identify multicast groups (section 2.1 multicasting on page 2);

It would have obvious to one ordinary skilled in the art at the time the invention was made to utilize Deerings teachings for learning all the link state and all the routers attached to that link using received membership reports from routers on the network with Shah teachings for constructing a unicast

routing table from received link state packets, wherein said tables corresponds to a short path tree from multicast routers, motivation to maintain a current image of the network topology using a protocol independent protocol based on unicast and multicast routing tables yet independent of any particular unicast routing protocol, as taught by Shah.

Regarding claim 2, performing reverse path forwarding using the multicast routing table (Shah: section 2.1 and 3.3).

Regarding claim 3, the link state advertisements comprise OSPF (Open Short Path First) link state advertisements (Shah: sections 2.2, 3.3, and section 2.1).

Regarding claim 4, the link state advertisements comprise MOSPF (Multicast Open Short Path First) link state advertisements (Shah: sections 2.1, and 3.3).

Regarding claim 6, constructing the multicast routing table comprises using Dijkstra's short path algorithm (Deering: section 2.2 and 3.3).

Claim 5, discussed below.

Regarding claim 7, correlates addresses of destination multicast capable routers with addresses of multicast capable routers on a short path tree of multicast capable routers (Deering: section 3, section 4).

Claim 8 cancelled.

Regarding claim 9, configuring PIM (Protocol Independent Multicasting) to use the multicast routing table (Shah: section 2.1).

Claims 10-12 discussed below.

Regarding claim 13, substantially the same as claims 1-7 when combined, same rationale of rejection is applicable.

Claim 14 cancelled.

Regarding claims 15-16, these claims are substantially the same as claim 3 and 11-12, respectively, discussed above, same rationale of rejection is applicable.

Regarding claim 17, this claim comprises the computer program product, disposed on a computer readable medium, for multicast routing, the computer program including instructions for causing a computer to perform the method discussed on claim 1, same rationale of rejection is applicable the apparatus, i.e. software implementation.

Regarding claims 18-19, these claims are the computer program product disposed on a computer readable medium for performing the method claims discussed above, the computer program including instruction for causing a computer to perform the method claims, specifically, claims 2, 4 and 7, respectively, same rationale of rejection is applicable.

Regarding claims 20,22, these claims are the computer program product disposed on a computer readable medium for performing the method claims discussed above, the computer program including instruction for causing a computer to perform the method claims, specifically, claims 9, and 11-12, respectively, same rationale of rejection is applicable.

6. Claims 10-12 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deering, S., in view of Shah, et. al. (Shah), in further view of Haggerty et. al. (Haggerty) U.S. Patent No. 6,331,983. Regarding claim 10, however the above prior art does not explicitly teach performing a PIM RPF check function;

Haggerty teaches providing a routine for a PIM RPF check function (col 14/lines 66-col 15/line 9, col 18/lines 13-18).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to incorporate performing PIM RPF check routine as taught by Haggerty, motivation would be to prevent loops in the spanning trees, as taught by Haggerty.

Regarding claims 11-12, reverse path forwarding in sparse mode and reverse path forwarding in dense mode (Haggerty: col 14/lines 55-col 15/line 9).

Regarding claim 5, constructing the multicast routing table comprises determining if a router is a multicast router by determining if its corresponding received packet is a multicast packet (Haggerty: col 6/lines 12-22).

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 13 and 17 as amended are also are rejected under 35 U.S.C. 102(b) as being anticipated by Introduction to IP Multicasting Routing, Maufer, S., 3Com Corp., Jan. 1997.

Regarding claims 1, 13 and 17, Maufer teaches substantial features of the invention as claimed, teaching constructing a (“multicast routing”) table or database from received link state packets (sections 7.2-7.2.1.2) using MOSPF, the multicast routing table corresponding to a short path tree through multicast routers (section 7.2.2), table entries contain link state advertisement having multicast capable bit set indicating that the associated router is multicast router (section 7.2.2); constructing a (“unicast”) table or database from the received link state advertisement packet using unicast routing protocols such as RIP or OSPF (section 1.3.1 and sections 7.1.4), and performing reverse path forwarding using the multicast routing table corresponding to a short path tree through multicast routers upon arrival of multicast packets (section 6.2.1-6.2.1.1).

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Prosecution of this application is closed by means of this final office action § 1.113, applicant may request continued examination of the application by filing a Request for Continued Examination of under 37 CFR § 1.114 and providing the corresponding fee set forth in § 1.17(e) for the submission of, but not limited to, new arguments, an information disclosure statement, an amendment to the written description, claims, drawings, or new evidence in support of patentability. Or applicant whose claim has been twice rejected, may appeal from the decision of the administrative patent judge to the Board of Patent Appeals and Interferences under 35 U.S.C. §134.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prieto, B. whose telephone number is (703) 305-0750. The Examiner can normally be reached on Monday-Friday from 6:00 to 3:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's Supervisor, Jack B. Harvey can be reached on (703) 305-9705. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800/4700.

Any response to this final action should be mailed to:

**Box AF**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

or faxed to the Central Fax Office:

(703) 872-9306, for Official communications and entry

Or Telephone:

(703) 306-5631 for TC 2100 Customer Service Office

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington  
VA, Sixth Floor (Receptionist).

*B. Prieto*

B. Prieto  
TC 2100  
Patent Examiner  
January 21, 2004

*Jack B. Harvey*  
**JACK B. HARVEY**  
**SUPERVISORY PATENT EXAMINER**